

Claims 1-16 are rejected under 35 U.S.C. § 102 as being unpatentable over Sutter or White et al separately. Amendments requested to drawing figures and specification are made herein and hereunder through the attachments. Substitute drawing figures 2-4, 26 and 29 are enclosed with this response. Claims 1, 4, 5, 10, and 14 are amended in response to rejections under 35 U.S.C. § 112.

A device may be defined by what it does. A claim may describe what a device is adapted to do. That adaptation may have structural certainty to the skilled person with disclosure of the invention in the specification, drawings and claims sufficient for the purposes of distinguishing the invention from the prior art. The particular adaptation described in the pending claims distinguished the invention from the prior art.

It is critical in evaluating patent claims to appreciate the significance of the step change away from the prior art. Few people in the plastics industry have experience with thermokinetic mixers. Among those few, only Elmer Good realized before the present invention that they could be used to melt polymers in the chamber and that they would surprisingly all drop out as a single molten mass after heating only through bouncing around inside the chamber. It was thought before the Good patent in the cited references that polymers melting inside the chamber would cling to the extensions and inside surface of the chamber. Good proved them wrong. However, the state of the art for thermokinetic mixers for melting polymers is still in its infancy. The present invention is the first device to be specifically designed for melt blending polymers thermokinetically, i.e., without external heat.

However, certain things are known about thermokinetic mixers, as discovered by the present inventors. High rotational speed and high horsepower must be delivered to the shaft. Below a definite rotational speed, polymers do not impinge the inside surface or the extensions with enough shear force to be pulled like taffy and generate heat thereby. The present invention as described in the specification and drawing figures show that each shaft extension is "adapted to encounter the particles and drive them at least in part to the

inside surface such that substantial energy is imparted to them". The shaft extensions adapted according to the invention must extend to very close to the inside surface of the chamber.

The Manual of Patent Examining Procedure ("MPEP") states: "the failure to provide explicit antecedent basis for terms does not always render a claim indefinite. If the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite." MPEP § 2173.05(e) (6th ed. Rev. 1, Sept. 1995); see Ex parte Porter, 25 USPQ2d 1144, 1146 (Bd. Pat. Apps. & Int. 1992); see also In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971) ("[T]he definiteness of the language employed must be analyzed--not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art.").

The blades of Sutter and White et al are not structurally adapted to have the claimed function. Sutter's blades are for "crumbly or soft pastelike products". There is no evidence of record that shows they are "adapted to encounter the particles and drive them at least in part to the inside surface such that substantial energy is imparted to them". It is well known that the operation of a dough mixer is to generally wrap a body of dough around the shaft and maintain it generally in the bottom half of the mixing container. Gravity effects are critical for successful operation of a dough mixer. The blades of Sutter are incapable of operation that would result in the claimed function. The shaft claimed shaft extensions are adapted so that they are short enough and have no more than two adjacent teeth whose faces are faces slanted in the same direction. The mixing faces of the blades of Sutter are slanted in the same direction to move the dough toward the dropout chute. The mixing faces of the blades of White et al are slanted in the same direction to move the steam-fluidized grain particles to the other end of the mixing container. Thus, the blades of Sutter and White are not adapted to achieve the claimed function, and in fact could not be adapted to achieve that function. The blades of White et al are shown in operation with steam mixing in part particles driven toward the end of the mixing chamber, not to the

inside surface of the mixing chamber with substantial force. Such adaptation for White et al would crack the grain and render the intended invention inoperable. Neither Sutter or White et al would suggest the present adaptation due to their intended function. Claims 1 and 10 are not anticipated by Sutter or White et al.

"(C)laim construction does not involve interpreting the claim language as a series of disjointed words." (Pactiv Corporation v. S.C. Johnson & Son, Inc., No. 01-1158 (Fed. Cir. 2002)).

It was said in the last office action that claim 2 was anticipated by Sutter. Sutter shows a blade extending to a bolt shaft that is threaded on the end. It was said in the last office action that the nut that screws on to the bolt shaft was a "base portion being removable from the shaft". In order for the base portion to be removable from a shaft, it must first be attached to the shaft, which the nut in Sutter is not. The present invention has a base that engages the shaft with a slotted connection to securely hold it in place so that a replaceable and hardened blade face can be mounted on it. Interpreting the base portion of the invention to be identical with the nut screwing on to a bolt shaft is improper. Claim 2 is incapable of being anticipated by Sutter.

It was said in the last office action that claim 3 was anticipated by Sutter. Sutter shows a blade in the single drawing figure with almost 50 percent of the mixing blade face is the rounded leading edge. The relative percentage of rounded edge to the angled part of the blade can be seen in the lowermost blades. There is no "major face" in Sutter disclosing a flat and angled tooth face. A "major face" must be convincingly more than the 50 percent angled face in Sutter. The present invention eliminates the rounded leading edge. Claim 3 cannot be anticipated by Sutter.

It was said in the last office action that claims 4 and 5 were anticipated by Sutter. Sutter shows a blade with a rounded surface with two trailing angled surfaces for dough mixing. There is no "leading edge" in Sutter. Claims 4 and 5 cannot be anticipated by Sutter.

It was said in the last office action that claim 6 was anticipated by Sutter. Sutter shows a blade with bolt shaft extending from the bottom end of the blade that passes through a shaft and is held on with a nut. There is no slot or key. Claim 6 cannot be anticipated by Sutter.

It was said in the last office action that claim 7 was anticipated by Sutter. Sutter shows a blade with bolt shaft extending from the bottom end of the blade that passes through a shaft and is held on with a nut. The use of language in the analysis in the last office action is inconsistent. It was construed that the base portion was found in the nut. The nut is not shielded by the blade. The opposite is true as to the threaded end 16". Claim 7 cannot be anticipated by Sutter.

It was said in the last office action that claim 8 was anticipated by Sutter. Sutter shows a blade with a single exceptionally flat surface on the side angled toward the mixing dough. There is not a hint of a separate part of that blade face with a different angle. Claim 8 cannot be anticipated by Sutter.

It was said in the last office action that claim 9 was anticipated by Sutter. Sutter shows a blade with top end parallel with the inside surface of the mixing chamber. The lower blades in the single drawing figure show that parallel relationship. The bevel top of claim 9 is not shown in any respect in Sutter. The top end of the blade in Sutter can't mechanically drive particles into the inside surface of the mixing chamber. Claim 9 cannot be anticipated by Sutter.

With respect analysis of claims 13-16 with regard to Sutter, please review the above corresponding claims.

It was said in the last office action that claims 11 and 12 were anticipated by White et al. White et al shows blades adapted to evenly distribute in a "plug flow" grain fluidized with steam. The blades of White are not adapted to be the shaft extensions of the invention. Claims 11 and 12 cannot be anticipated by White et al.

It was said in the last office action that claim 12 was anticipated by White et al. White et al shows blades adapted to evenly distribute in a "plug flow" grain fluidized with steam. The blades of White are not adapted to be the shaft extensions of the invention. Claims 11 and 12 cannot be anticipated by White et al.

White et al has blades with a flat sides. Such a blade cannot be found to have a lower bevel face as claimed. A flat face is shown in the blades of White et al and no combined angling of faces is shown or described. White et al cannot anticipate claim 15.

White et al has blades with a flat top end that rotate in a cylindrical chamber. Such a top end cannot mechanically achieve the function of driving the grain particles against the inside surface of the mixing chamber. White et al cannot anticipate claim 16.

Consideration of the above amendments and remarks is requested and it is submitted that such amendments and remarks place the application in a condition for allowance for claims 1-16. Applicant requests entry of amendments and allowance of such claims.

Respectfully submitted,

Dated: 04/02/2002

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APPENDIX 1

This Appendix 1 is incorporated in the above amendment made in this application and contains the amended paragraphs of the specification and claims in the form showing stricken material in brackets and new material as underlined.

Specification Amendments

Page 3, lines 14-15:

Figures 5-9 are respectively cross sections [AA and BB and sections C, D, and E] V-V and VI-VI and sections VII, VIII and XI of Figure 4.

Page 3, lines 24-25:

Respectively for the bottom housing and top housing are Figures 26-28 and 29-31, the series of three figures being respectively top, end and Section [AA] X and XI views.

Claim Amendments

1. A thermokinetic mixer comprising:

- (a) a substantially cylindrical mixing chamber with an inside surface enclosing a shaft rotatable at relatively high speed substantially about the axis of the cylindrical mixing chamber, the mixing chamber adapted to receive particles of polymers and other material therein; and
- (b) shaft extensions removable from the shaft, the shaft extensions adapted to encounter the particles and drive them at least in part to the inside surface such that substantial energy is imparted to them.

4. The mixer of claim 3 wherein the leading edge comprises most of a height of the shaft [extension] extensions.

5. The mixer of claim 3 wherein the shaft [extension] extensions rises from the shaft to very close to the inside surface.

10. A thermokinetic mixer comprising:

- (a) a substantially cylindrical mixing chamber with an inside surface enclosing a shaft rotatable at relatively high speed substantially about the axis of the

cylindrical mixing chamber, the mixing chamber adapted to receive particles of polymers and other material therein;

- (b) shaft extensions comprising a tooth face, each shaft extension adapted to encounter the particles and drive them at least in part to the inside surface such that substantial energy is imparted to them; and
- (c) the tooth face comprising a major face, the major face being substantially flat and oriented such that when passing through a plane including the shaft axis the major face first encounters the plane with a leading edge of the major face and the major face extends along an acute angle therefrom away from the plane.

14. The mixer of claim 13 wherein the shaft [extension] extensions rises from the shaft to very close to the inside surface.